

transitioning to different items in the media list **211** can be performed faster when the finger is moved at greater speeds. In effect, to the user, the more rapid swirling of the finger enables effective acceleration of the transitioning of the list of media items **211**. Alternatively, the control assembly **212** and processor **214** may be combined in some embodiments.

[0055] Although not shown, the processor **214** can also control a buzzer to provide audio feedback to a user. The audio feedback can, for example, be a clicking sound produced by the buzzer. In one embodiment, the buzzer **216** is a piezo-electric buzzer. As the rate of transitioning through the list of media items increases, the frequency of the clicking sounds increases. Alternatively, when the rate that the finger is moved slows, the rate of transitioning through the list of media items decreases, and thus the frequency of the clicking sounds correspondingly slows. Hence, the clicking sounds provide audio feedback to the user as to the rate in which the media items within the list of media items are being traversed.

[0056] Additionally or alternatively, the system via the touch pad may be configured to transform radial motion an object such as a finger (as shown in **FIG. 3B**) into translational or linear motion on the display screen. By radial, it is meant that the object moves in a substantially radial direction from the center of the touch pad to an outer perimeter of the touch pad. In one embodiment, the touch pad is arranged to continuously determine the radial position of a finger relative to the planar surface of the touch pad. This allows a user to linearly scroll through a media list on the display screen by moving the object at least partially between the center and outer perimeter of the touch pad. For example, by moving the object between a small and large radius (e.g., 0-3 cm) on the touch pad. This may also allow a user to vary a characteristic of the media player. For example, by moving radially, the user may be able to change the volume of sound being played on the media player (i.e., acts like a potentiometer).

[0057] Referring to **FIG. 5**, a radial touch pad **218** will be discussed in accordance with one embodiment. By way of example, the touch pad **218** may replace the touch pad shown in **FIG. 4**. The touch pad **218** may be divided into several independent and spatially distinct zones **220** that are positioned radially from the center **222** of the touch pad **218** to the perimeter **224** of the touch pad **218**. Any number of radial zones may be used. In one embodiment, each of the radial zones **220** represents a radial position in the plane of the touch pad **218**. By way of example, the zones **220** may be spaced at 5 mm increments. Like above, each of the zones **220** has an associated sensor disposed therein for detecting the presence of an object such as a finger. In general, when an object approaches a zone **220**, and more particularly a sensor, a position signal is generated that informs the system **200** that the object is at a specific radial position on the touch pad **218**. When an object is moved between zones **220** or over multiple zones **220**, multiple position signals are generated. These multiple position signals may be used to determine radial location, direction, speed and acceleration of the object as its moved radially across the touch pad **218**.

[0058] Referring to **FIG. 6**, a combination angular/radial touch pad **228** will be discussed in accordance with one embodiment. By way of example, the touch pad **228** may replace the touch pad shown in **FIG. 4**. The touch pad **228**

may be divided into several independent and spatially distinct zones **230** that are positioned both angularly and radially about the periphery of the touch pad **228** and from the center of the touch pad **202** to the perimeter of the touch pad **228**. Any number of combination zones may be used. In one embodiment, each of the combination zones **230** represents both an angular and radial position in the plane of the touch pad **228**. By way of example, the zones may be positioned at both 2 degrees and 5 mm increments. Like above, each of the combination zones **230** has an associated sensor disposed therein for detecting the presence of an object such as a finger. In general, when an object approaches a combination zone **230**, and more particularly a sensor, a position signal is generated that informs the system **200** that the object is at a specific angular and radial position on the touch pad **228**. When an object is moved between combination zones **230** or over multiple combinations zones **230**, multiple position signals are generated. These multiple position signals may be used to determine location, direction, speed and acceleration of the object as its angularly and radially moved across the touch pad **228**. The angular and radial zones may be initiated at the same time or they may be initiated at different times. For example, the angular zones may be initiated for scrolling through a media player and the radial zones may be initiated for varying the volume of a media player.

[0059] It should be noted that although the touch pads of **FIGS. 4-6** are all shown as circular that they may take on other forms such as other curvilinear shapes (e.g., oval, annular and the like), rectilinear shapes (e.g., hexagon, pentagon, octagon, rectangle, square, and the like) or a combination of curvilinear and rectilinear (e.g., dome).

[0060] Furthermore, in order to provide higher resolution, a more complex arrangement of zones may be used. For example, as shown in **FIG. 7**, the touch pad **238** may include angular and radial zones **240** that are broken up such that consecutive zones do not coincide exactly. In this embodiment, the touch pad **202** has an annular shape and the zones **240** follow a spiral path around the touch pad **202** from the center to the outer perimeter of the touch pad **202**.

[0061] **FIGS. 8** is a partially broken away perspective view of an annular capacitive touch pad **250**, in accordance with one embodiment of the present invention. By way of example, the annular capacitive touch pad **250** may correspond to the touch pad of **FIG. 2**. The annular capacitive touch pad **250** is arranged to detect changes in capacitance as the user swirls an object such as a finger around the touch pad **250**. The annular capacitive touch pad **250** is also arranged to detect changes in capacitance as the user moves their finger radially across the touch pad **250**. The annular capacitive touch pad **250** is formed from various layers including at least a label layer **252**, an electrode layer **254** and a circuit board **256**. The label layer **252** is disposed over the electrode layer **254** and the electrode layer **254** is disposed over the circuit board **256**. At least the label **252** and electrode layer **254** are annular such that they are defined by concentric circles, i.e., they have an inner perimeter and an outer perimeter. The circuit board **256** is generally a circular piece having an outer perimeter that coincides with the outer perimeter of the label **252** and electrode layer **254**. It should be noted, however, that in some cases the circuit board **256** may be annular or the label **252** and electrode layer **254** may be circular.